increased operative risk. The Cox Maze III may significantly improve their outcome.

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Discussion

Dr John Doty *(Murray, Utah)*. This study represents a propensity-based analysis of adding surgical ablation to AVR and coronary bypass. These are procedures that typically do not require an atriotomy like a mitral valve operation. This shows that adding a concomitant modified Cox Maze operation will have similar outcomes but does not increase mortality and supports the safety and efficacy of AF ablation operations.

I have 3 areas I would like you to clarify. First, I would recommend you use the terminology ''modified Cox Maze III'' because I believe that you use both cryoablation and radiofrequency. Can you explain the percentage of patients you used for each of those and how your group selects which energy modality that you use?

Dr Ad. I disagree with you on the definition. It is not a modified Cox Maze procedure. The Cox Maze procedure is a principle, and the Cox Maze III procedure is a set of lesions that are being applied as a template and it does not matter how you deliver the lesions. The terminology of a modified Cox Maze procedure is confusing because it does not matter how you perform the entire lesions of the Cox Maze procedure, radiofrequency, cryotherapy, and so on. It is a principle that we should all account for. The Cox Maze III procedure is a concept. I disagree with the terminology of modified, and I am clear about it whenever I give a talk on the topic.

In this series, the patients had the Cox Maze procedure lesion set. Basically, in the past we used a combined bipolar radiofrequency ablation and cryotherapy. On the basis of our observation with bipolar radiofrequency ablations related to reconnections as published in a few articles in the past few years, we moved away from that. Currently, all of our patients are now are being treated with cryothermal energy.

Dr Doty. Second, your midterm results for restoration of sinus rhythm are excellent. How do you measure that, and has there been a difference between the radiofrequency and cryoablation cases over time?

Dr Ad. Basically there is no difference between the different energy sources as of yet, but we still follow all the patients. We developed our own registry and a follow-up system that is based on 3, 6, 9, 12, 18, and 24 months, and yearly thereafter, and at each time point the patients are measured with electrocardiogram and 24-hour Holter monitoring. However, at 6 and 24 months they are also getting a 1-week Holter monitor. The results reported in this article are based only on electrocardiogram and Holter monitoring

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because not all patients agree to wear a monitor for 1 week at 6 and 24 months. To just level the playing field, those reports are per electrocardiogram and Holter monitoring, and Heart Rhythm Society guidelines are being used, meaning that any event more than 30 seconds is a failure.

Dr Doty. Finally, as you mentioned, some surgeons are reluctant to add an ablation procedure, even those with small incisions using alternative energy because of the perceived risk of bleeding and prolonged bypass. Could you elaborate on your series of patients and results with that, particularly among your own partners? You mentioned that you do ablation in almost all of your patients, but you are having different results from the rest of the group.

Dr Ad. I think that is one of the key points. True prospective randomized studies looking at multiple centers are lacking. We just submitted an abstract to the Society of Thoracic Surgeons on a scoring system in which we score 1 and 0 using different variables, such as older age and EF, and then we factor in the surgeon experience. What we found is that the percentage of patients in whom the Maze procedure was performed is decreasing when the surgeon experience is limited or the complexity of the case is higher. This resulted in more patients directed to me, and now I am performing approximately 90% to 95% of those procedures for our group; it is the same process with other procedures when you get into this subspecialization within the group. The real answer should come with an effort looking into a prospective randomized study, and I know there is such an effort through the Cardiothoracic Surgery Network and the National Institutes of Health–sponsored study. It is an important study because the question is important for choosing who should receive AF and who should receive extra care. If you just do the aortic valve, should you open the left atrium for a full Maze procedure or offer a limited procedure with a lower success rate and perceived lower risk? On the basis of my latest experience, my personal approach is that the sicker the patient, the more beneficial it is to add the Maze procedure because you can restore AV synchrony, even with pacing, during the perioperative period. We do not deal with high ventricular response rate, arrhythmias, and such. It is easier to manage those patients. Yes, you do extend surgery specifically for CABG and AVR, but only 30 to 45 minutes, which is insignificant with the kind of myocardial preservation we have today. This article is showing that together with the long-term benefit, it should offer better outcome to patients with aortic and coronary artery disease. With the cardiopulmonary bypass management, we have to deal with cardioplegia. I think adding 30 to 45 minutes of bypass time is not as big a deal as it was 10 years ago.

Dr John Chen *(Honolulu, Hawaii)*. Are you treating this group of patients, the AVR group, the same as your mitral valve group with AF in your practice?

Dr Ad. Unless they have new-onset AF and a left atrium less than 3.5 cm, which for the subgroup of patients who are not included in this article, we perform a full Maze procedure in all of them, yes. For those with new-onset AF and a small left atrium, we are performing only pulmonary vein isolation and AVR or CABG.